RCSL No: 43-GL11689

Edition: October 1981

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Title:

RC855
IBM3780 Remote Job Entry Workstation
User's/Operating Guide

RCSL 42-11592

A/S REGNECENTRALEN
af 1979

Keywords:

English language, RC855, IBM3780 RJE, operating.

Abstract:

This manual describes the use and operating of the RC855 IBM3780 Remote Job Entry (RJE) Terminal Program.

(24 printed pages)

Printed by A/S Regnecentralen af 1979, Copenhagen

RCSL 42-i1592

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1. INTRODUCTION 1.

1.1 General 1.1

The RC855 IBM 3780 RJE terminal program perforns the following functions:

1) Connection and disconnection of the communication line.

2) Transmission of console-commands from the keyboard and data from diskette (CPM-files).

3) Receival of data on printer, on printer and display or on diskette (CPM-files).

The terminal program can run on up to 8 terminals connected via RC-circuit (1 master and 7 slaves). From the slaves it is only possible to transmit files.

1.2 Communication Line 1.2

The communication line is a point to point connection, with a maximum speed of 9600 BPS. The line protocol is the Binary Synchroneous Communication (BSC) procedures as described in IBM GA273004.

The transmission code is EBCDIC.

The blocksize on the communication line is 512 bytes.

Transparency, Terminal identification (ID), Spacecompression, Printer horizontal format control (HT), Escape Sequences (CCW) and component select are supported. Punchdata is handled as printdata.

1.3 Handling of Diskette Records 1.3

When data is transmitted from the diskette (CPM-file) in non-transparent mode, each record on the diskette is converted from ASCII to EBCDIC and transmitted as 1 record of 80 bytes. A record on the diskette is terminated by CR, NL or both. If a record is less than 80 bytes, it is filled with spaces. If a record is greater than 80 bytes it is splitted into a number of 80 bytes records (the last filled with spaces). The diskette file should be terminated by the SUB-character (hex 1A).

When data is transmitted from the diskette (CPM-file) in transparent mode, all data (including CR and NL) are transmitted without conversion. The data is splitted into records of 80 bytes. The transmission is terminated at physical end of file.

1.4 Handling of Printer Records 1.4

When receiving data on the printer, the ESC-sequences (CCWs) are interpreted in the following way:

ESC M	space 0 lines	after print
ESC /	space 1 line	
ESC S	space 2 lines	
ESC T	space 3 lines	
ESC A	skip to channel 1 (FF)	

All other ESC-sequences will be interpreted as a vertical tab (VT).

If no ESC-sequence is present, ESC / is assumed.

If non-transparent data are received, conversion from EBCDIC to ASCII is performed. If transparent, no conversion is done.

2. OPERATING 2.

2.1 System LOAD/RUN 2.1

For system-load see special instructions.

Master System:
When the system is loaded, it is automatically trying to connect the line. After connection of the line the terminal will go into idle mode and one of the below mentioned functions (receive data, transmit data etc.) must be selected by pressing the associated function key. The terminal is always displaying what it is doing, e.g. when the system is loaded the following is displayed:

```
RC855 IBM 3780 TERMINAL

TERMINAL IS CONNECTING THE LINE
THE LINE IS CONNECTED

TERMINAL IS IDLE
SELECT FUNCTION
```

Slave System:
When the system is loaded, it is automatically trying to establish connection to the master. When this connection is established one of the below mentioned functions (transmit data, display status etc.) must be selected by pressing the associated function key. The terminal is always displaying what it is doing, e.g. when the system is loaded the following is displayed:

```
RC855 IBM 3780 TERMINAL
SLAVE STATION

WAITING FOR MASTER
MASTER CONNECTED

TERMINAL IS IDLE
SELECT FUNCTION
```

When a function, which needs more information from the operator, is selected, the operator is guided through by questions from the terminal (filenames for transmission etc.).

2.2 Functions on MASTER 2.2

2.2.1 Transmission of DATAFILES 2.2.1

Function key PA1:
This function can be selected when the terminal is idle or waiting for receival. This function makes it possible to transmit 1-10 files from a CPM diskette. When the transmission is finished the terminal goes into receive mode as if PA4 was selected.

After selection of PA1, the display is cleared and the following text appears:

```
PA1 TRANSMIT SELECTED

TYPE MAX. 10 FILENAMES: <FILENAME>:<UNIT>
IF LESS THAN 10 NAMES, PRESS AN EXTRA RETURN AFTER THE LAST
FILENAME TO START THE TRANSMISSION
TO STOP AND RETURN TO IDLE STATE PRESS PF11.
```

Type in the filenames:
The filenames can either be the actual filenames or the name of a command-file containing the actual filenames. A command-file can contain from 1-10 filenames (CPM file with 1 filename in each record, terminated by CR-NL, file terminated by hex. 1A). Only 1 command file can be given in each select of PA1.

If it is a command-file type C-<filename>:<unit>

A filename is max. 12 characters, if more than 12 characters are typed, the 12 first are used and the rest is skipped. After filename, :<unit> can be written.

<unit> is the diskette unit (starting with 0) on which the file is located. If no unit is written, unit 0 is assumed. No spaces must be written between <filename>, : and <unit>.

When the transmission is started 3 lines are displayed for each file (1 in the beginning and 2 at the end of the file):

```
TERMINAL IS TRANSMITTING FILE <filename>

END OF FILE <filename>
NUMBER OF RECORDS = NNNNN
```

NNNNN is number of records transmitted from file <filename>. If some records on the diskette is greater than 80 bytes they are counted as number of records they are splitted into.

2.2.2 Transmission of CONSOLE-COMMANDS 2.2.2

Function key PA2 or PA3.
This function can be selected when the terminal is idle or waiting for receival. This function makes it possible to transmit 1 line keyed in from the keyboard.

When the transmission is finished, the terminal goes into receive mode as if PA4 was selected. If PA2 the receival will be on printer as normally, but if PA3 the receival will be on both the printer and the display.

After selection of PA2/PA3, the display is cleared and the following text appears:

```
PA2/PA3 TRANSMIT CONSOLE COMMAND SELECTED
TYPE COMMAND:
```

Type in the command (max. 80 characters terminated by return). To return to idle mode without sending a command, press PF11.

2.2.3 Receival on PRINTER 2.2.3

Function Key PA4.
This function can be selected when the terminal is idle. The function is automatically selected after succesful transmission of datafiles (PA1) or console commands (PA2/PA3).

This function makes it possible to receive data on the printer. The terminal will remain in receive mode until another function is selected or the line is disconnected from the other end.

2.2.4 Receival on CPM-DISKETTE 2.2.4

Function Key PA5.
This function is not implemented yet.

2.2.5 Display TERMINAL STATUS 2.2.5

Function Key PF10.
This function can always be selected.

When selected, current state of the terminal and parameter values will be displayed.

This function does not change the state of the terminal.

2.2.6 STOP 2.2.6

Function Key PF11.
This function can always be selected.

When selected, current activity is interrupted immediately. If the line was not yet connected, the terminal will go into disconnected state. If the line was connected, the terminal will go into idle state after having aborted a possible transmission/ receival by sending EOT (end of transmission).

2.2.7 DISCONNECT 2.2.7

Function Key PF12.
This function can always be selected.

When selected, current activity is interrupted immediately. The line will be disconnected by sending DLE-EOT and removing the modem signal DTR (data terminal ready).

The terminal will enter the disconnected state.

2.2.8 CONNECT 2.2.8

Function Key PF13.
This function can be selected when the terminal is in disconnected state.

The function is automatically selected when the system is loaded.

The line will be connected, by setting the modem signal DTR (data terminal ready) and waiting for the modem signal DSR (dataset ready).

When the line is connected the terminal will enter the idle state.

2.2.9 WAIT CONNECTION 2.2.9

Function Key PF14.
This function can be selected when the line is not yet connected (terminal is disconnected or terminal is connecting the line).

This function makes it possible to run the terminal in an "automatic" mode. (E.g. if the terminal is connected to a host-computer that during night-time calls the terminal to receive data from and/or transmit data to it).

In "automatic" mode there are two possibilities:

1) The terminal waits for a call (dial up).

   The call causes the connection of the line. (The terminal waits for CI (calling indicator), sets DTR (Data Terminal Ready) and waits for DSR (Data Set Ready)).

   When the line is connected, the terminal enters the receive-mode as if PA4 was selected. The terminal will continue to receive on the printer until the line is disconnected from the other end (DLE-EOT is received).

   This is what happens if only PF14 is selected.

2) The terminal waits for a call as in 1).

   When the line is connected, 1-10 files from a CPM diskette are transmitted. After the transmission the terminal enters receive-mode as in 1).

   This is what happens when the operator selects PA1 after PF14 (while the terminal is waiting for the call).

2.2.10 CHANGE PARAMETERS 2.2.10

Function Key PF15.
This function can be selected when the terminal is disconnected or idle.

This function makes it possible to change the parameters. When the parameters are changed, PF11 must be given to return to disconnected or idle state.

After selection of PF15, the display is cleared and the following text appears:

```
1 PARAMETER NAME = <CURRENT VALUE>
2 PARAMETER NAME = <CURRENT VALUE>
.
.
.
N PARAMETER NAME = <CURRENT VALUE>

TYPE PARAMETER = NEWVALUE OR PARAMETER NUMBER = NEWVALUE:
```

To change a parameter type in the name of the parameter followed by = and then the new value, terminated by return. No spaces are allowed before and after the = sign. Instead of typing the name of the parameter, it is possible to type the parameter number (1, 2 ... N). When a parameter is changed the newvalue will be displayed, and it is possible to change a parameter again or terminating by PF11.

Following parameters exist:

```
1 TRANSPARENCY = OFF
2 RECEIVE-ID = NONE
3 TRANSMIT-ID = NONE
```

The above list of parameters shows the default values.

1 TRANSPARENCY

Possible values ON and OFF.

When transparency is OFF, data transmitted from the terminal will be non-transparent.

When transparancy is ON, data transmitted from the terminal will be transparent.

It is always possible to receive both non-transparent and transparent data.

2 RECEIVE-ID

3 TRANSMIT-ID

RECEIVE-ID and TRANSMIT-ID are the terminal identification used when receiving and transmitting.

NONE means no id is used. A terminal identification is 1-15 characters. When changing these parameters, typing more than 15 characters - the first 15 are used and the rest is skipped. Typing no characters (receive-id =) means no id.

If a receive-id is specified, it is checked that the terminal/ host computer sending data to this terminal is using this identification, otherwise it will be rejected.

If a transmit-ID is specified, the terminal will use this identification when transmitting.

2.2.11 Switch of Receival on the Display 2.2.11

Function Key PRINT.
This function can be selected when the terminal is waiting for receival or receiving, after a console command has been transmitted with PA3.

2.2.12 Autoload 2.2.12

Function Key CLEAR.
This function can be selected when the terminal is in disconnected mode.

This function makes it possible to make a system autoload. If the system diskette is the CPM system diskette, it is a "return to CPM".

After selection of CLEAR, the display is cleared and the following text appears:

```
MOUNT SYSTEM DISKETTE
PRESS CR:
```

When the wanted system diskette is mounted press return.

2.3 Functions from Slave 2.3

2.3.1 Transmission of Datafiles 2.3.1

See subsection 2.2.1.

2.3.2 Display Terminal Status 2.3.2

Function Key PF10.
This function can always be selected.

When selected, current state of the terminal and parameter values will be displayed. If the state is idle then the state of the communication line is displayed (disconnected, idle or busy). This requires information from the master. Trying to get this information can force the slave terminal into disconnect mode if the master gives no response. In this case the text "Waiting for master" will appear, and the slave will automatically try to get connection to the master.

When the line is idle, it is possible to transmit files from the slave terminal.

2.3.3 STOP 2.3.3

See subsection 2.2.6.

2.3.4 Change Parameters 2.3.4

See subsection 2.2.10. Only parameter number 1 (transparency) exists in the slave-terminals.

2.3.5 Autoload (Return to CPM) 2.3.5

Function Key CLEAR.
This function can be selected when the terminal is in idle mode.
See subsection 2.2.12.

3. MESSAGES 3.

3.1 Informative Messages 3.1

The informative messages are messages telling the operator what the terminal is doing and messages telling that the operator has given some illegal commands etc. The operator need not take any action on informative messages.

The informative messages are self explaining, but a few of them which need a further explanation are listed below (in alphabetic order):

MASTER:

ABORT RECEIVED

The remote site has aborted the current transmission by sending EOT. The terminal automatically enters the idle state.

CONTENTION

The terminal and the remote site are both bidding for the line by sending ENQ. (To receive the data, the remote site wishes to send press PF11 and PA4).

DATASET NOT READY

The modem signal dataset ready is off. The terminal automatically enters the disconnect state.

ILLEGAL ID RECEIVED

The remote site is using another terminal identification than the one specified in parameter receive-id. To allow the remote site to transmit the receive-id check can be removed by setting the parameter receive-id to nothing.

LINE DISCONNECTED REMOTE

The remote site has disconnected the line by sending DLE-EOT. The terminal automatically enters the disconnect state.

RVI RECEIVED

The remote site has sent an RVI (reverse interrupt) while the terminal is transmitting data. This means that the remote site has something to send. The terminal continues to transmit. The operator can stop the transmission with PF11 and receive the data from the remote with PA4.

TERMINAL IS BIDDING FOR THE LINE

The terminal is requesting the line by sending ENQ. The terminal will repeat ENQ until the remote site answers ACK0 or the operator interrupts with PF11 (STOP) or PF12 (DISCONNECT).

SLAVE:

MASTER DISCONNECTED

The connection to the master has been disconnected due to an error on the circuit, while a transmission was going on. The transmission is interrupted and the terminal is automatically trying to get connection to the master.

TERMINAL IS BIDDING FOR THE LINE

The slave is requesting the master for permission to use the communication line for transmission of data. The slave will repeat requesting until the master gives permission or the operator interrupts with PF11.

TRANSMISSION STOPPED BY MASTER

The current transmission has been stopped by the master either by the operator or due to an event on the communication line (dataset not ready, abort, remote disconnect etc.).

TERMINAL IS WAITING FOR THE MASTER

The connection to the master has been disconnected, and the terminal tries to reestablish the connection.

3.2 Error Messages 3.2

Error messages are messages telling the operator that an error has occured, which need an action to be taken. All error messages are listed below:

Messages concerning the printer:

PRINTER IS OFFLINE

The printer is off-line (off-line, no paper, no power etc.). Repair the erroneous condition and set the printer on-line. The printing wil automatically continue.

Messages concerning the diskette:

All these messages are terminated by: "Select PF11 to stop anything else means continue". Continue is repeat (try again) except if it is a file which does not exist, then skip this file and continue with the next.

DISKETTE CRC ERROR
DISKETTE HARDWARE
DISKETTE OFF LINE
DISKETTE WRITE LOCK
} self explaining

DISKETTE UNREADABLE

The diskette cannot be read, probably wrong type of diskette.

FILE DOES NOT EXIST <filename>

The file <filename> does not exist on the mounted diskette.

Other messages:

DATA FORMAT ERROR

This message should not occur. Save information about what the terminal was doing, when it occurred. The terminal automatically enters the idle state.

3.3 Exceptions 3.3

Exceptions should not occur. If an exception occurs, some lines with exception number, module, some line-numbers etc., are displayed and the system is locked. Save all the information about the exception. Start the system by means of autoload (reset).

A. LIST OF FUNCTIONS A.

MASTER

PA1	Transmit 1-10 CPM-files from diskette
PA2	Transmit console command
PA3	Transmit console command and switch on display of received data
PA4	Receive on printer
PA5	Receive on diskette (CPM-file)
PF10	Display Terminal status
PF11	Stop (enter idle state)
PF12	Disconnect (stop and disconnect the line)
PF13	Connect (connect the line)
PF14	Wait Connection (automatic mode)
PF15	Change Parameters
PRINT	Switch off display of received data
CLEAR	Autoload (Return to CPM)

SLAVE

PA1	Transmit 1-10 CPM-files from diskette
PF10	Display Terminal Status
PF11	Stop (enter idle state)
PF15	Change Parameters
CLEAR	Autoload (Return to CPM)

RETURN LETTER

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